GL800 midi Logger

DATAQ® INSTRUMENTS

Built-in 5.7" TFT LCD Color Display

Stand-alone or PC-connected operation

20 Analog Channels Standard, Expandable to 200

Input-to-output and channel-to-channel Isolation

USB and Ethernet PC Interfaces

With its color monitor and internal memory the GL800 is a compact, lightweight, multi-channel data logger that provides 20 standard analog measurement channels, expandable to 200. The GL800 is equipped with a large internal flash memory to allow the direct capture of acquired data, and its built-in USB port may be used to connect any standard USB flash drive for incremental capacity. Alternatively, the USB or the integral Ethernet port may be connected to a PC to allow data upload in real time or from memory, as well as local or remote configuration and real time data acquisition. The Ethernet feature includes WEB and FTP server functions, which allows monitoring from a remote location as well as data transfer.

Wide Voltage Measurement Range

Each GL800 analog channel can measure from 20 mV to 50 VFS across eleven programmable measurement ranges.

Full Electrical Isolation Per Channel

Each analog GL800 channel is electrically isolated from all others and from instrument ground to allow accurate and safe measurements in industrial applications where ground potential differences are common.

Features

Voltage, Current, and Temperature Measurement Functions

Use the GL800 to measure voltages, currents, 4-20 mA process currents, as well as thermocouple- and RTD-based temperatures.

Four Unique 'Pulse' Inputs for Discrete Measurements

The GL800 provides discrete input channels that can be used for counting and rotational speed measurement applications. Or program the discrete inputs as simple logic level input channels.

Four Alarm Outputs

Program the GL800 to trigger its open-collector outputs as a function of analog input signal level judgment, pulse judgment, or logic pattern.

Wide Sample Interval Selections

Sample intervals can be programmed to be one of sixteen values ranging from 100 ms to one hour.

Bright TFT LCD Color Display

The focal point of the GL800 is its built-in 5.7-inch color display that allows real time trending, data review, and complete instrument configuration.

Engineering Units Scaling

Each GL800 channel allows up to four break points to be programmed for accurate scaling into meaningful units like psi, grams, newtons, gallons per minute, etc.

Flexible Triggering Options

The GL800 allows data capture to be started or stopped based upon signal level, an external event, date/time, alarm, duration, or Boolean channel combinations. Analog signal triggers can be programmed based upon level and window tests: above threshold, below threshold, inside window, or outside window.

Real Time and Post-recorded Calculations

The GL800 may be programmed to calculate average value, peak value, minimum value, and rms.

Flexible Power Requirements

Power the GL800 from its provided international AC adaptor, from an optional built-in battery pack, or from any 9 to 24 VDC source using an optional cable.

PC Connectivity via USB or Ethernet

Allows data transfer to the PC either in real time or from the GL800's memory. Also allows complete configuration of the GL800.

PC Software Bundle Included

The GL800 includes a Windows application for direct capture, measurement, and monitoring of GL800 data. In addition to waveform and data value capture and display, the application can export data to an Excel file for further analysis and report creation. The software includes built-in help for quick reference.

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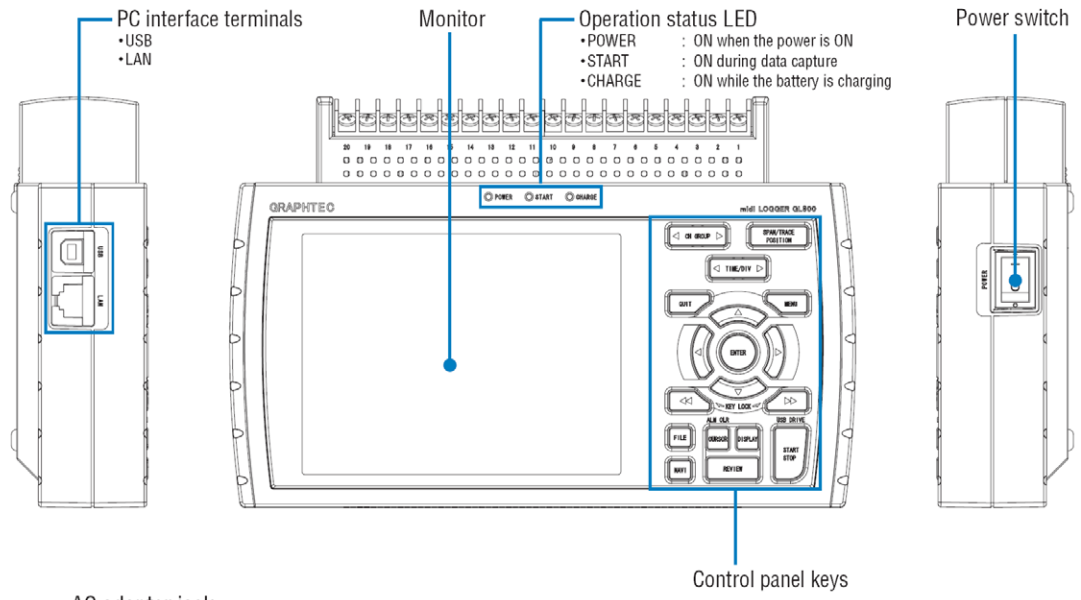
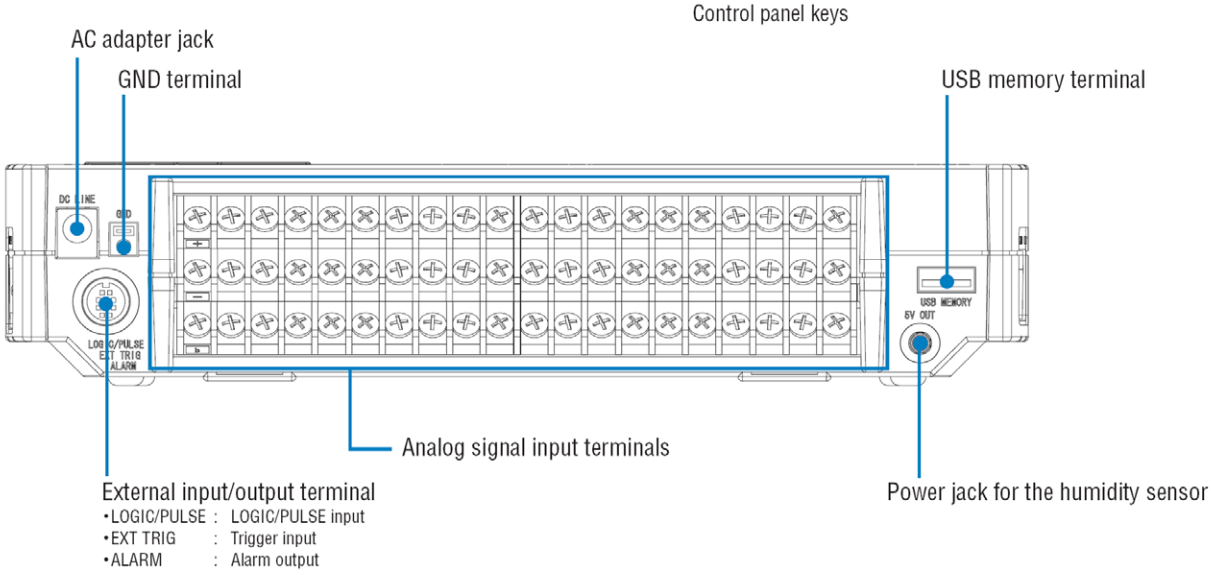
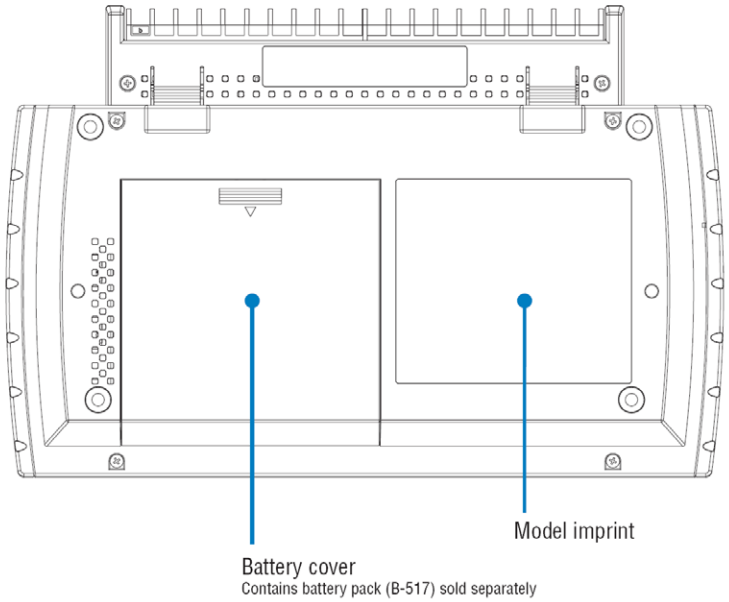
GL800 Display, I/O, and Control Overview

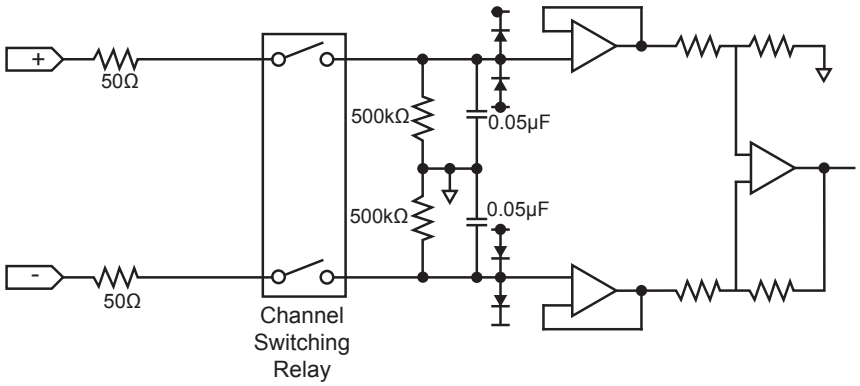






GL800 Analog Input Circuit and Measurement Ranges

Each GL800 analog input channel features electrical isolation using a photo MOS relay switching method to maintain safe and accurate measurements in demanding industrial environments.



Voltage Measurement Ranges per Channel

Range	Maximum SPAN	Minimum SPAN	Minimum Resolution
20mV	-22.000 to +22.000mV	0.200mV	0.001mV
50mV	-55.00 to +55.00mV	0.50mV	0.01mV
100mV	-110.00 to +110.00mV	1.00mV	0.01mV
200mV	-220.00 to +220.00mV	2.00mV	0.01mV
500mV	-550.0 to +550.0mV	5.0mV	0.1mV
1V	-1.1000 to +1.1000V	0.0100V	0.0001V
2V	-2.2000 to +2.2000V	0.0200V	0.0001V
5V	-5.500 to +5.500V	0.050V	0.001V
10V	-11.000 to +11.000V	0.100V	0.001V
20V	-22.000 to +22.000V	0.200V	0.001V
50V	-55.00 to +55.00V	0.50V	0.01V

Process Current Measurement (with external 250-ohm resistor)

Range	Maximum SPAN	Minimum SPAN	Minimum Resolution
1-5 V	-5.500 to +5.500V	0.050V	0.001V

Temperature Measurement Ranges per Channel

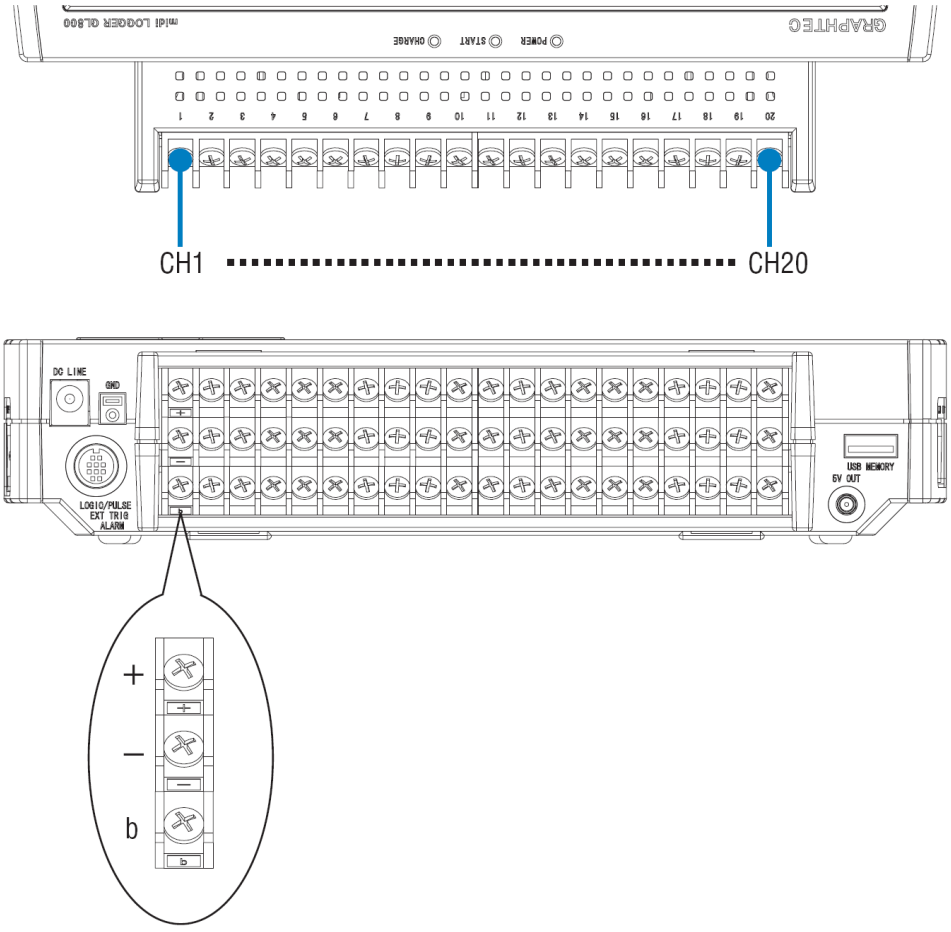
Range	Maximum SPAN	Minimum SPAN	Measurement Range	Minimum Resolution
K	-270 to +2000°C	50°C	-200 to +1370°C	0.1°C
J			-200 to +1100°C	
T			-200 to +400°C	
R			0 to +1600°C	
E			-200 to +900°C	
B			+600 to +1920°C	
S			0 to +1760°C	
N			0 to +1300°C	
W			0 to +2315°C	
PT100			-200 to +850°C	
JPT100			-200 to +500°C	
PT1000			-200 to +500°C	

Optional Humidity Measurement Range

Range	Maximum SPAN	Minimum SPAN	Minimum Resolution
0 to 100%	0 to +110%	1.0%	0.1%

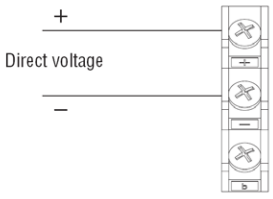
Typical GL800 Analog Signal Connections

Terminal Configuration

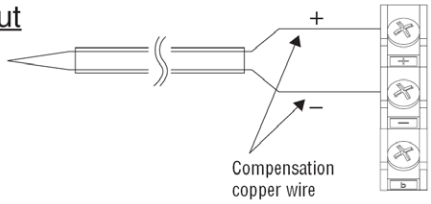


Signal Types and Typical Connections

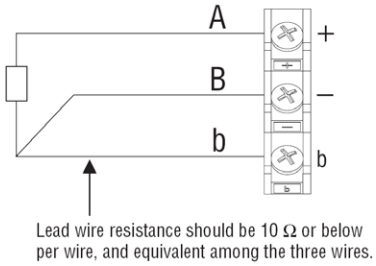
Direct voltage input



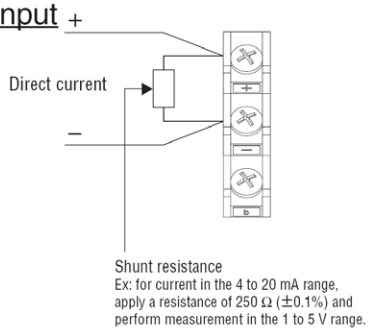
Thermocouple input



Resistance temperature detector input



Direct current input


+
Direct current
–
Shunt resistance
Ex: for current in the 4 to 20 mA range,
apply a resistance of 250 Ω (±0.1%) and
perform measurement in the 1 to 5 V range.

+	.....	High -voltage terminal (terminal for high voltage signals)
-	.....	Low-voltage terminal (terminal for low-voltage input signals)
b	.....	Dedicated terminal when connection resistance temperature detector

Program the GL800 for Real-World Trigger Conditions

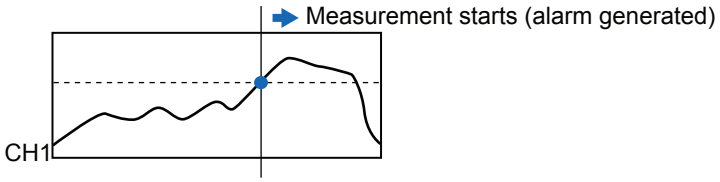
The GL800 can adapt to just about any trigger condition you might encounter. Data recording can be stopped or started as a function of analog signal level, a definable alarm condition, an external event, or specific date and time. Beyond initiating a data capture cycle, the GL800 can also be programmed to set a digital output to flag an external alarm condition. And after a trigger condition is executed you can program the GL800 to automatically rearm itself to wait for another trigger event, or stop entirely. You can even program the GL800 to detect and alarm on a thermocouple burnout condition. Here's a summary of the GL800's trigger and alarm features:

GL800 Trigger and Alarm Overview

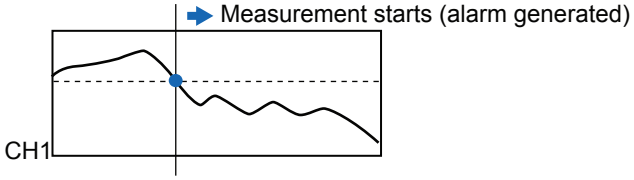
Setting	Selections Available
Start side source setting	Off, Level, Alarm, External Input, Date
	Level: Mode, Level, Combination
	Alarm: Alarm port number
	External input: none
	Date: Date, Time
Stop side source setting	Off, Level, Alarm, External Input, Date, Time
	Level: Mode, Level, Combination
	Alarm: Alarm port number
	External input: none
	Date: Date, Time
	Time: Duration
Repeated capturing	On, Off
Alarm level settings	Mode, Level, Output
Alarm hold	On, Off
Send burnout alarm	On, Off

GL800 Trigger Modes

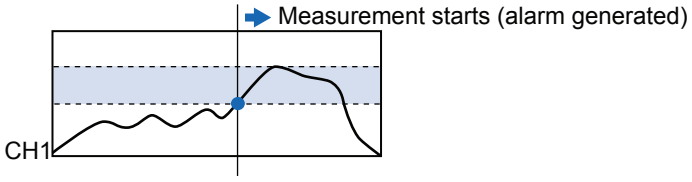
Above Threshold



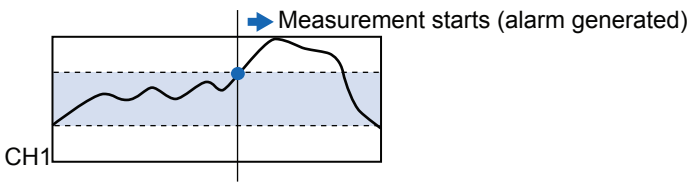
Below Threshold



Inside Window

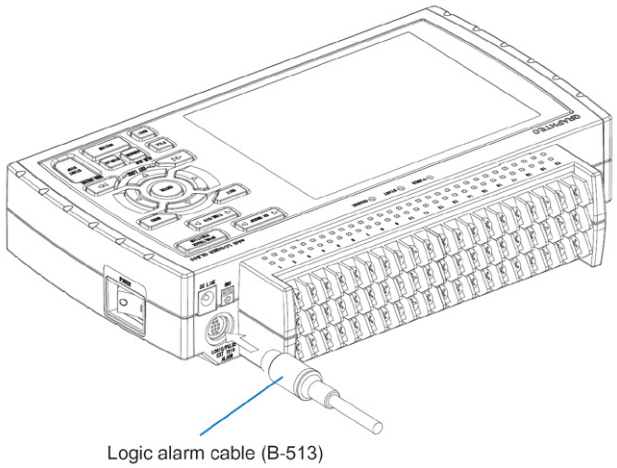


Outside Window



GL800 Logic, Pulse, Alarm, and External Trigger Connections

The Logic Alarm Cable model B-513 provides access to the GL800's discrete and pulse inputs, external trigger input, and alarm outputs. The cable is two meters in length, and is purchased separately.



Logic/Pulse Specifications

Item	Description
Number of input channels	4
Input voltage range	0 to +24V max (single-ended ground input)
Threshold level	Approx. +2.5V
Hysteresis	Approx. 0.5V (+2.5 to +3 V)

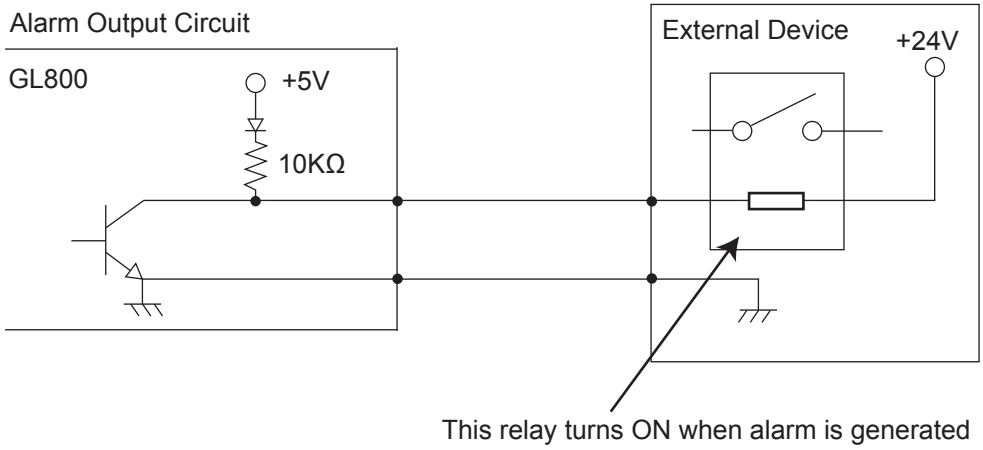
Trigger Input Specifications

Item	Description
Number of input channels	1
Input voltage range	0 to +24V max (single-ended ground input)
Threshold level	Approx. +2.5V
Hysteresis	Approx. 0.5V (+2.5 to +3 V)

Alarm Output Specifications

Item	Description
Number of output channels	4
Output format	Open collector output +5V, 10KΩ pull-up resistance Contact capacity 5 V to 24 V, 100mA or below

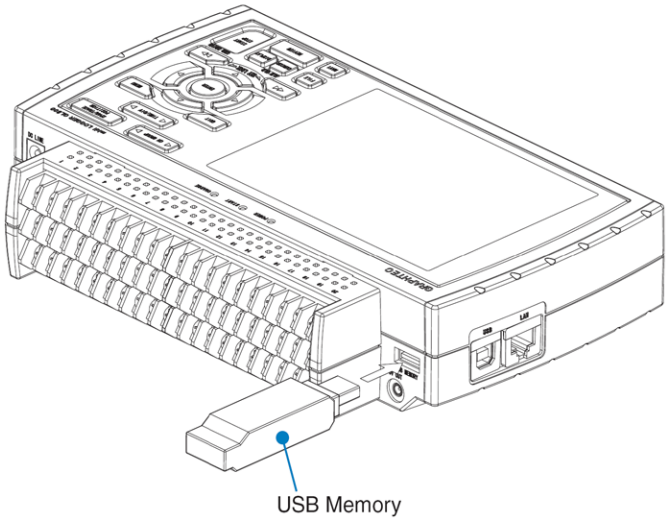
Circuit Example of Relay Drive by Alarm Output



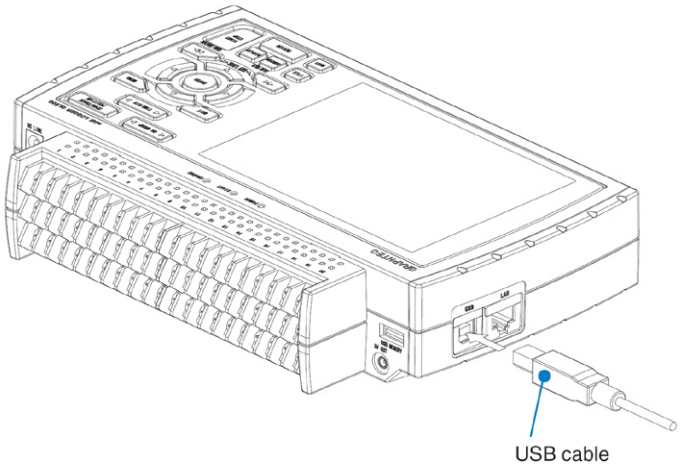
Flexible Computer Interfaces, and an Optional Battery Pack

The GL800 provides the added benefit of PC connectivity to either a USB or Ethernet port. Both interfaces are standard, and the USB port doubles as a method to expand the GL-800's internal 12 MB memory to a maximum 2 GB capacity using standard USB flash memory. When either interface is connected to a PC you can upload measurement protocols to the GL800, monitor acquired data in real time, or download previously acquired data. The GL800's Ethernet interface offers the advantage of allowing the GL800 to function as a Web server, allowing the GL800 to be manipulated from any web browser such as Firefox or Internet Explorer. Finally, an optional battery pack may be added to the GL800 to allow power-independent data recording whenever and wherever it's required.

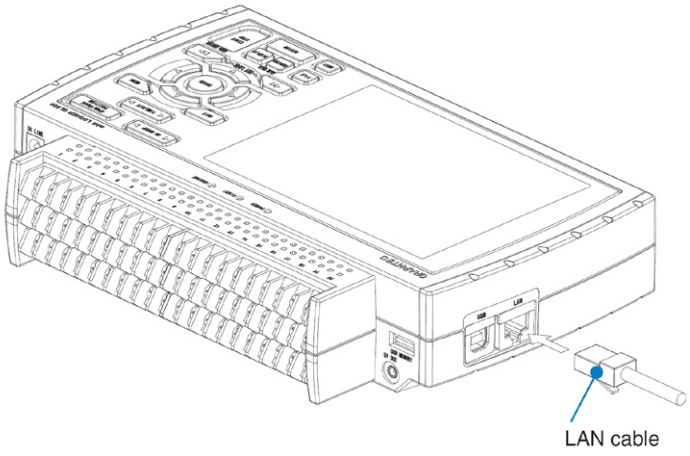
USB Flash Drive Memory Expansion



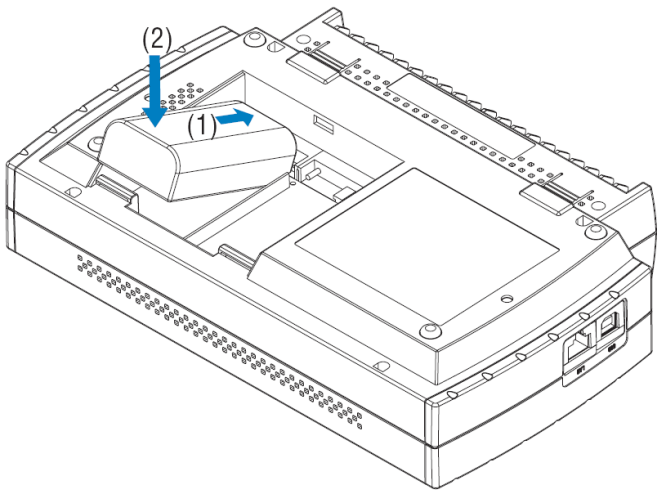
USB-to-PC Interface Connection



Ethernet Interface Connection

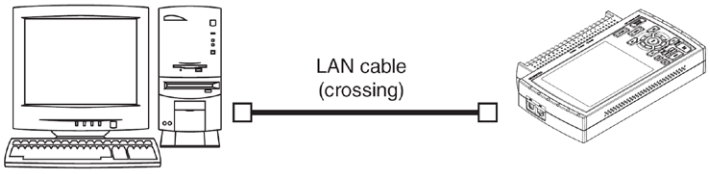


Optional B-517 Battery Pack

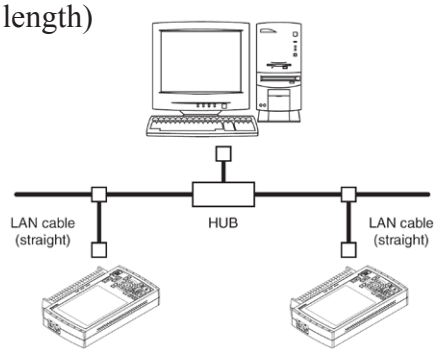


Ethernet Deployment Examples

Directly to a PC using a cross-over cable (100 meter maximum length)



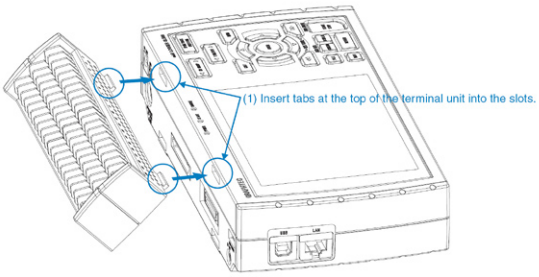
Over a local area network (LAN) using hubs or switches (unlimited length)



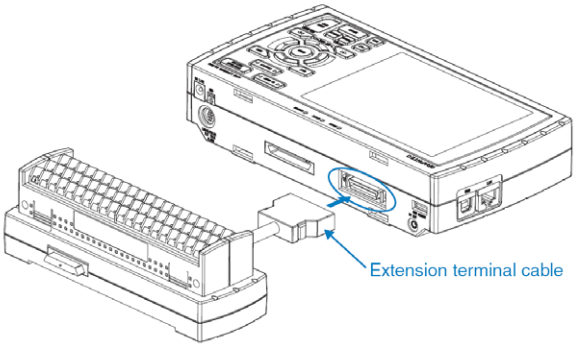
GL800 Analog Channel Expansion and Extension Options

Adding more flexibility to where and how the GL800 can be deployed, the analog input screw terminal unit may be detached from the GL800 and located up to 23 inches away using the optional B-537 Extension Kit. If you need channel expansion beyond the 20 channels provided by the base GL800, then use one or more B-538 Expansion Kits (plus ONE B-537 Extension Kit) to expand your channel count in 20-channel increments to a maximum of two-hundred.

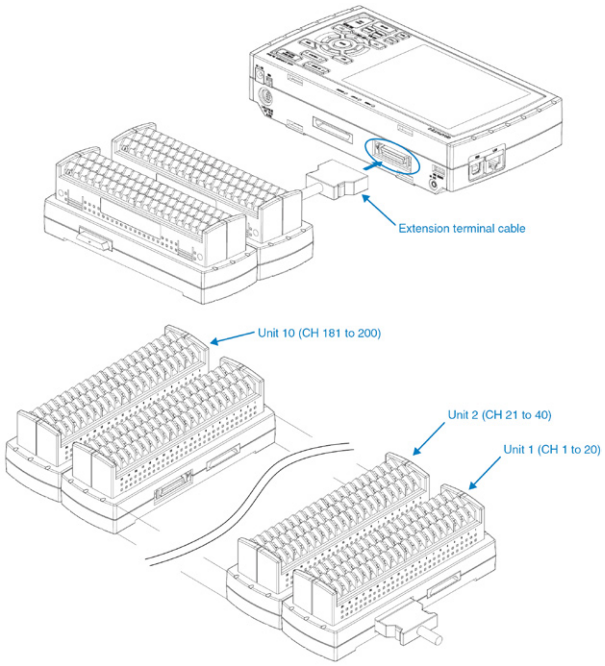
The Terminal Unit may be removed from the GL800...



…and Relocated up to 23 inches away using the B-537 Extension Kit



then use a B-538 Expansion kit to expand GL800 channel count to as many as 200

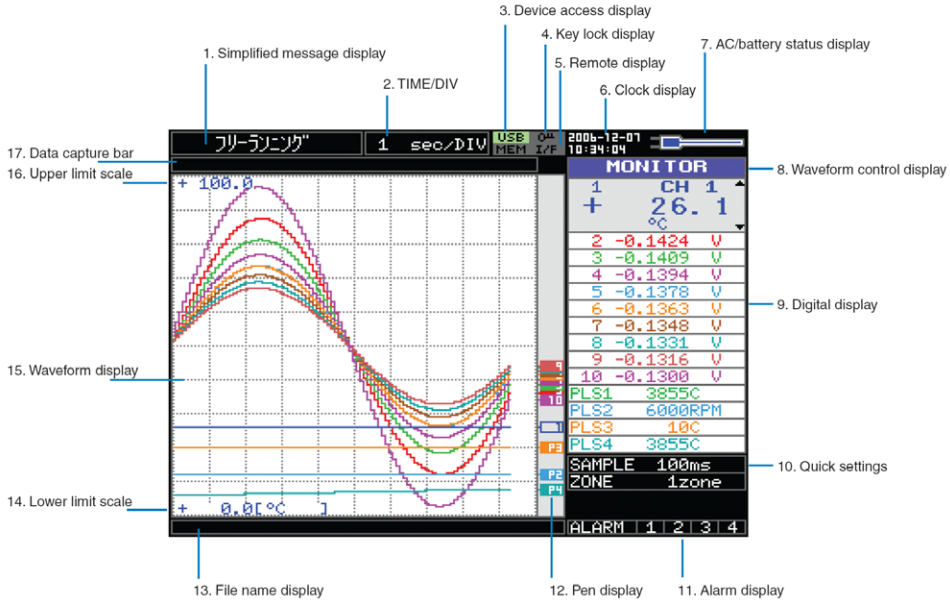


Expansion Ordering Chart				
	20 Channels	40 Channels	100 Channels	200 Channels
GL-800	1	1	1	1
B-537 Extension Kit	-	1	1	1
B-538 Expansion Kit	-	1	4	9

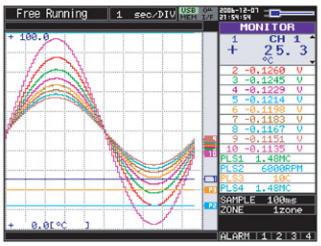
GL800 Display Quick-look

The GL800's keyboard and display are key components you'll use for any typical data recording session. The display is a full color TFT LCD (thin-film transistor liquid crystal display), the same technology used in modern flat-panel televisions. The display measures 5.7 inches diagonally, and offers 320 x 240 pixels of bright, clear, high contrast resolution. The GL800's keyboard allows full access to the instrument's menu system as viewed through its display. Navigation is straightforward and intuitive using the keyboard's navigation and ENTER keys that form the center of the array. Other keys support special operations that are clearly annotated.

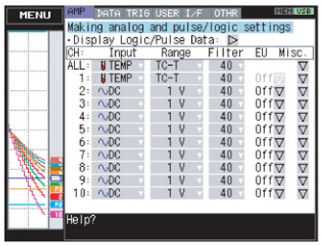
GL800 Display Close-up and Modes



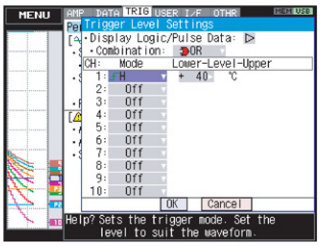
MONITOR



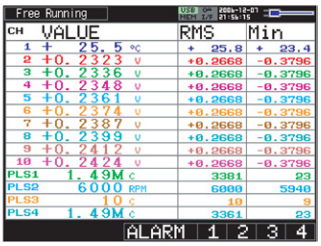
AMP settings



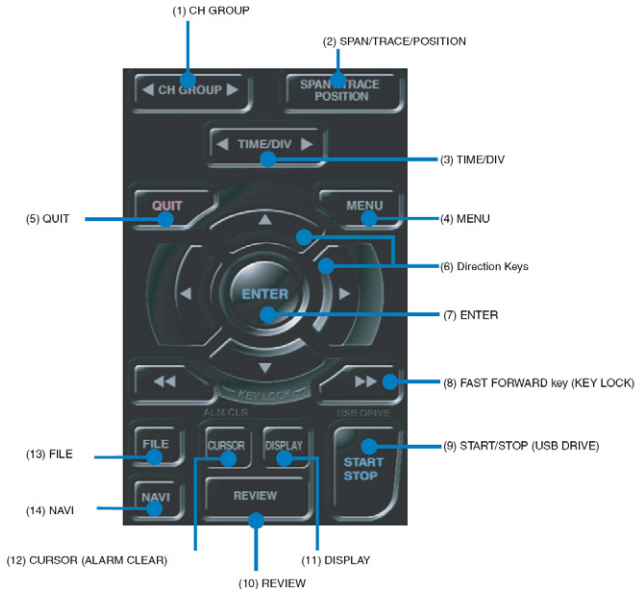
Level settings



Digital screen



Keyboard Close-up



GL800 Included and Optional Accessories

Included PC Software

Item	Description
Compatible OS	Windows 2000, Windows XP
Functions	Main unit control, real time data capture, data conversion
Main unit settings	Input, memory, alarm, trigger
Allowed connection	up to 10
Number of channels per connection	200 ch maximum
Maximum number of channels	500 ch maximum
Settings	AMP, data, trigger/alarm, report, others
Captured data (CSV, Binary)	Real time data, Memory data, USB memory data
Display	Analog waveforms, logic waveforms, pulse waveforms, digital values
Display modes	Y-T, X-Y, Digital, Meter, Report
File conversion	Between cursors. All data.
Monitor functions	Alarm monitor enables sending of e-mail to the specified address
Dual-screen function	Displays the current data alongside past data
Report function	Automatic creation of daily or monthly files
Statistic/History	Displays max, min, and average values during measurement

Included Accessories

Item	Description
Quick Start Guide	GL800-UM-8xx
CD-ROM	User's manual, application software
AC adapter	100 to 240 VAC, 50/60 Hz, power supply cord for each area

Optional Battery Pack model B-517

Item	Description
Capacity	7.2V/2200mAh
Battery type	Lithium secondary battery
Running time (up to 2 battery packs can be mounted)	<When LCD is ON> 1 battery pack: MAX brightness: approx. 2.5 hours; MIN brightness: approx. 3 hours 2 battery packs: MAX brightness: approx. 5 hours; MIN brightness: approx. 6 hours <When LCD is OFF> 1 battery pack: approx. 4.5 hours; 2 battery packs: approx. 9 hours
Charging method	Mount in the main unit
Time required for charging	1 battery pack: approx. 4 hours; 2 battery packs: approx. 8 hours
Switchover in the case of power failure	Because the battery is used together with the AC adapter, the power supply will be switched automatically to the battery in the event of power failure. The AC adapter is the primary power source
Operating environment	15 to 40°C
Other functions	When battery is running low, file is closed automatically (when captured to USB or internal memory). Remaining amount indicator.

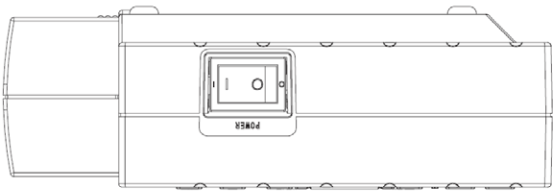
Optional Humidity Sensor model B-530

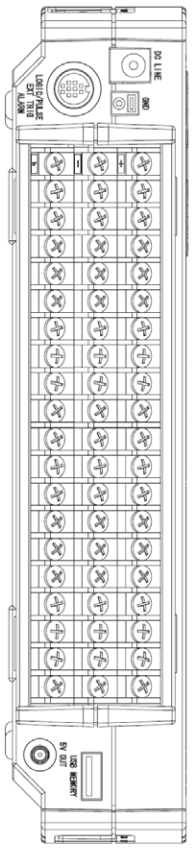
Item	Description
Alowable temperature range	-25 to 80°C
Allowable Humidity Range	0 to 100%
Relative humidity measurement accuracy	±3% RH (5 to 98% RH at 25°C)
Response time	15 s (90% response when membrane filter installed)
Sensor output	0 to 1 VDC
Sensor power source	5 to 16 VDC
Power consumption	approx. 4mA
External dimensions	14mm × 80 mm (excluding cable)
Cable length	3m

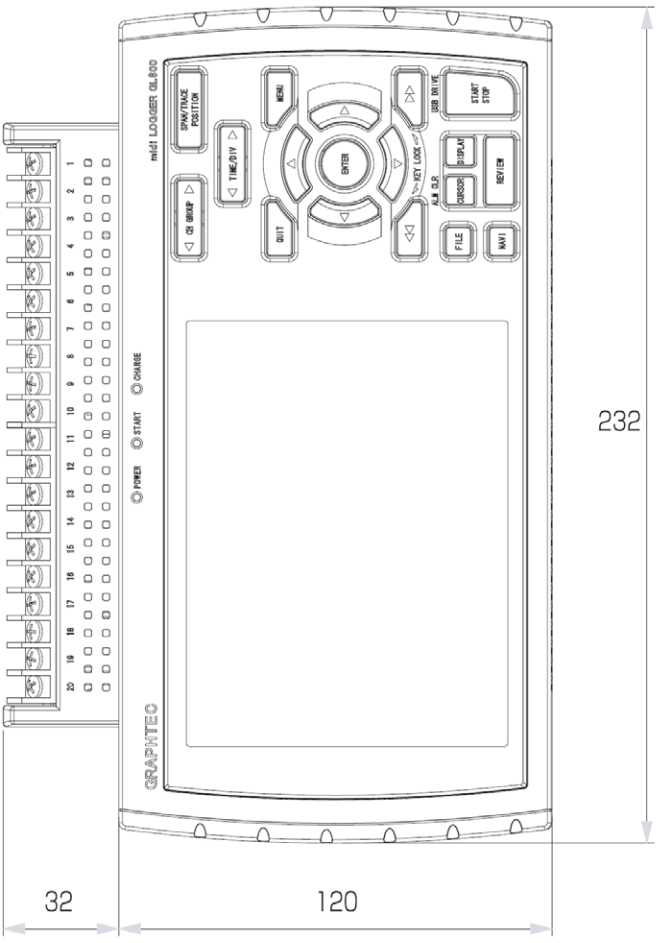
Other Optional Accessories

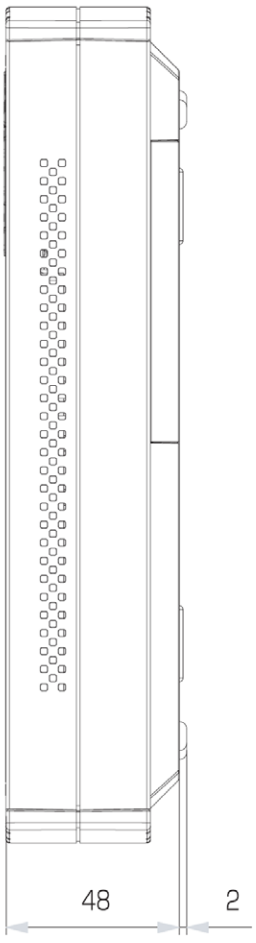
Item	Option	Description
DC power cable	B-514	Bare tips (2 m)
Extension terminal base set	B-537	Extension terminal base unit, cable
20 channel extension terminal set	B-538	20 terminals, extension terminal base unit, connection plate, screws
Logic alarm cable	B-513	2m, bare tips
Carrying Case	B-536	Durable carrying case designed specifically for the GL800

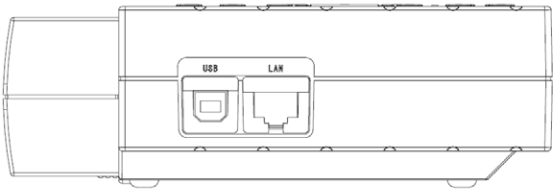
GL800 External Dimensions











Dimensional precision: ±5 mm
Unit: mm

GL800 Specifications

Overall Specifications

Number of analog inputs: 1 unit: 20 channels
Extension unit: Maximum 200 channels

External input/output: Trigger input, Logic input 4 channels or Pulse input 4 channels, Alarm output

PC interface: Ethernet (10Base-T/100Base-TX), USB (high speed supported) provided as standard features.

Internal memory devices: Internal memory: approx. 12 MB
USB memory slot (FullSpeed supported) standard

Data backup functions: Setup conditions: EEPROM; Clock: lithium secondary battery

Operating Environment: 0 to 45°C, 5 to 85% RH (15 to 40°C when using batteries)

Withstand voltage: Between each input channel and GND terminal: 1 minute at 350Vp-p
Between each input terminal: 1 minute at 350Vp-p

Power supply: AC adapter: 100 to 240 VAC, 50/60 Hz
DC input: 8.5 to 24 VDC
Battery pack (option): 7.2 VDC (2200 mAh), 2 packs mountable

Power Consumption: AC Power consumption (when AC adapter is used)

Condition	Normal Consumption	Consumption during battery recharge
LCD on	16 VA	28 VA
Screensaver on	11 Va	22 VA

DC Power consumption

DC Voltage	Condition	Normal Consumption	Consumption during battery recharge
+24V	LCD on	0.3 VA	0.7 VA
+24V	Screensaver on	0.2 VA	0.6 VA
+12V	LCD on	0.55 VA	Can't Recharge
+12V	Screensaver on	0.3 VA	Can't Recharge
+8.5V	LCD on	0.8 VA	Can't Recharge
+8.5V	Screensaver on	0.45 VA	Can't Recharge

Note: normal status is when LCD brightness is set to MAX

External Dimensions: 232 × 152 × 50 mm

Weight: 990g (excluding AC adapter and battery)

Vibration-tested conditions: Equivalent to automobile parts Type 1 Category A classification

Overall Functional Specifications

Display Screen: Waveform screen + Digital screen, Expanded Waveform screen, Digital screen + Calculation Display screen (can be key-toggled)

Sampling interval: 100 ms/10 ch maximum; 100, 200, 500 ms; 1, 2, 5, 10, 20, 30 s; 1, 2, 5, 10, 20, 30 min; 1 h

EU Scaling function: 4 points can be set for each channel.

Review function: Data replay during data capture

Data save functions: Capture to internal memory, capture to USB memory, setup data can be saved, copy of data screen saved.

Calculation: Types of operation: Average value, peak value, max/min value, RMS.
2 operations can be set simultaneously
Method: real time and between cursors specified (during data replay)
Note: Calculation results are displayed in Digital screen + Calculation Display screen

Search functions: Function: Search the captured data for the required number of points
Search type: Channel pulse, logic, alarm search

Annotation input function: Function: A comment can be input for each channel.
Inputtable characters: Alpha numerics
Number of characters: 11 (8 displayed)

Analog Channel Specifications

Number of inputs: 20 channels (maximum 200 channels with extension unit)

Input terminal type: M3 screw type terminals

Input method: Photo MOS relay scanning system
All channels isolated, balanced input

Scan speed 0.1s/10 ch maximum

Measurement Ranges

Voltage: Voltage: 20, 50, 100, 200, 500 mV; 1, 2, 5, 10, 20, 50 V; 1-5 V F.S.

Temperature: Thermocouples: K, J, E, T, R, S, B, N, W (WRe5-26)
Resistance temperature detector: Pt100, JPt100, Pt1000 (IEC751)

Humidity: Humidity: 0 to 100% (voltage 0 V to 1 V scaling conversion) *with B-530 (option)

Measurement accuracy*

Voltage: 0.1% of Full Scale

Temperature (Thermocouple):

TC	Measurement Temperature Range (°C)	Measurement Accuracy (°C)
R/S	0 ≤ Ts ≤ 100 100 < Ts ≤ 300 R: 300 < Ts ≤ 1600 S: 300 < Ts ≤ 1760	±5.2 ±3.0 ±(0.05% of rdg +2.0) ±(0.05% of rdg +2.0)
B	400 ≤ Ts ≤ 600 600 < Ts ≤ 1820	±3.5 ±(0.05% of rdg +2.0)
K	-200 ≤ Ts ≤ -100 -100 < Ts ≤ 1370	±(0.05% of rdg +2.0) ±(0.05% of rdg +1.0)
E	-200 ≤ Ts ≤ -100 -100 < Ts ≤ 800	±(0.05% of rdg +2.0) ±(0.05% of rdg +1.0)
T	-200 ≤ Ts ≤ -100 -100 < Ts ≤ 400	±(0.1% of rdg +1.5) ±(0.1% of rdg +0.5)
J	-200 ≤ Ts ≤ -100 -100 < Ts ≤ 100 100 < Ts ≤ 1100	±2.7 ±1.7 ±(0.05% of rdg +1.0)
N	0 ≤ Ts ≤ 1300	±(0.1% of rdg +1.0)
W	0 ≤ Ts ≤ 2315	±(0.1% of rdg +1.5)
Reference contact compensation accuracy: ±0.5°C		

Resistance Temperature Detector:

Type	Measurement Temperature Range (°C)	Applied Current	Measurement Accuracy (°C)
Pt100	-200 to 850 (FS=1050)	1mA	±1.0
Jpt100	-200 to 500 (FS=700)	1mA	±0.8
Pt1000	-200 to 500 (FS=700)	0.2mA	±0.8

* 23°C ±3°C when 30 minutes have elapsed after the power was switched on (filter On (10), 1 s/20 ch sampling, GND connected).

Reference contact compensation accuracy: Internal/External switching

A/D converter: 14 bits

Temperature coefficient: Gain: 0.01% of F.S./ °C

Input resistance: 1 MΩ ±5%

Allowable signal source resistance: Within 300Ω

Maximum permissible input voltage: Between +/- terminals: Between input terminal/input terminal; Between input terminal/GND: 60 Vp-p

Withstand voltage: Between input terminal/input terminal : 1 min. at 350 Vp-p
Between input terminal/GND : 1 min. at 350 Vp-p

Insulation resistance: Between Input terminal/GND: At least 50 MΩ (at 500 VDC)

Common mode rejection ratio: At least 90 dB (50.60 Hz; signal source 300 Ω or less)

Noise: At least 48 dB (with +/- terminals shorted)

Filter: Off, 2, 5, 10, 20, 40
Filter operation is on a moving average basis. The average value of the set sampling count is used.

Integral TFT LCD Display

Display: 5.7-inch TFT color LCD (QVGA: 320 x 240 dots)

Displayed languages: Japanese, English, Others

Backlight life: 50,000 hrs (when brightness is down to 50%), depends on operation environment

Backlight: Screensaver function (10, 30 sec., 1, 2, 5, 10, 30, 60 min.)

GL800 Specifications (continued)

Internal Memory Devices

Memory capacity: Internal memory: approx. 12MB Flash memory
USB memory: Max 2 GB

Memory contents: Setup conditions, measured data, screen copy

Trigger Function Specifications

Repeat trigger: Off, On

Trigger types: Start: Data capture starts when a trigger is generated.
Stop: Data capture stops when a trigger is generated.

Trigger conditions: Start: Off, Level, External, Time, Alarm
Stop: Off, Level, External, Time, Duration, Alarm

Alarm judgment modes: Analog : H (↑), L (↓), Window In, Window Out
Logic : H (↑), L (↓)
Pulse : H (↑), L (↓), Window In, Window Out

Channel combination: OR, AND

PC Interface

Interface types: Ethernet (10Base-T/100Base-TX
USB (HighSpeed)

Software functions: Data transfer to PC (real time, memory)
PC control of the GL800

Ethernet functions: Web server function: Displays GL800s screen image on web broser, operation of GL800
FTP server function : Transfers and deletes files from internal memory and USB memory

Real time data transfer speed: 100 msec/10 ch maximum

Discrete I/O Specifications

Input/Output types: Trigger input (1 ch); Logic input (4 ch) or Pulse input (4 ch); Alarm output (4 ch)
Note: Switch between Logic and Pulse

Input specifications: Maximum input voltage: 0 to +24 V (single-ended ground input)
Input threshold voltage: Approx. +2.5V
Hysteresis: Approx. 0.5 V (+2.5 to +3 V)

Alarm output specifications: Output format: Open collector output (5 V, 10 KΩ pull-up resistance), Contact capacity 5 V to 24 V, 100 mA or below
Output conditions: Level judgment, window judgment, logic pattern judgment, pulse judgment

Pulse input

Revolutions mode (engines, etc): Function: Counts the number of pulses per second; enables them to be converted to rpms.
Spans: 50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M PRM/F.S.

Counts mode (electric meters, etc.): Function: Displays a count of the number of pulses for each sampling interval from the start of measurement.
Spans: 50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M C/F.S.

Inst. mode: Function: Counts the number of pulses for each sampling interval. Resets the count value after each sampling interval.
Spans: 50, 500, 5000, 50 k, 500 k, 5 M, 50 M, 500 M C/F.S.

Maximum number of pulse inputs: Counts, Inst. modes: 50k/sampling interval
Revolution counts mode: 50k/s

Ordering Guide

Description	Order No.	Description	Order No.
GL800 Compact, lightweight, multi-channel data logger that provides 20 standard analog measurement channels, expandable to 200.	GL800	**Extension Terminal Base Set** Extension terminal base unit with cable.	B-537
Battery Pack 7.2V/2200mAh Battery pack.	B-517	**20 Channel Extension Set** 20 channel terminals, Extension terminal base unit, connection plate, screws.	B-538
DC power cable 2-meter DC power cable, bare tips.	B-514	**Logic Alarm Cable** 2-meter, bare tips.	B-513
Carrying Case Durable case designed specifically for the GL800	B-536	**Humidity Sensor** 3-meter with dedicated power connector.	B-530

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